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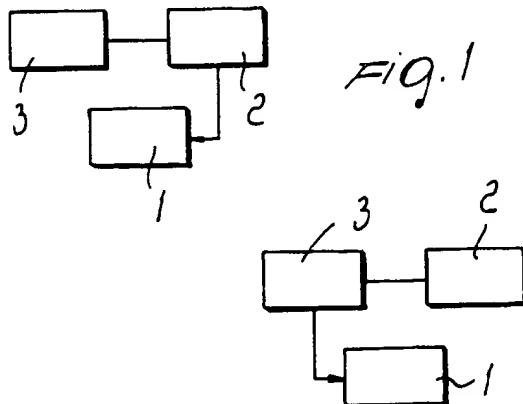
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## (54) Device for remotely monitoring vending machines and the like

(57) A device for remotely monitoring vending machines and the like, comprising cellular telephone communication means (1) which are associated with a vending machine in order to automatically transmit a call to notify of malfunctions and/or statistical and sales data of the vending machine.



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**Description**

[0001] The present invention relates to a device for remotely monitoring vending machines and the like.

[0002] It is known that vending machines are increasingly widespread for vending various products and operate without supervision, i.e., the person who runs the vending machine is often not directly correlated to the site where the vending machine is installed.

[0003] In the management of such vending machines it is common to need information on the operating state of said vending machines.

[0004] Since, as mentioned, the management of the vending machine is entrusted to companies which are not directly linked to the installation site of the vending machine, information concerning the correct or incorrect operation and the efficiency of the utilization of said vending machine are not immediately available for querying.

[0005] Accordingly, there are substantially two different ways of checking whether the vending machine is operating correctly or not.

[0006] A first way entails periodic visits to the installation of the vending machine to check that it is operating correctly and/or to perform preventive ordinary maintenance and extraordinary maintenance only in case of malfunction.

[0007] A second way instead entails waiting for malfunction reports by users of the vending machine.

[0008] The two above-described intervention options evidently do not meet the requirements of constant monitoring of the vending machine substantially in real time and at low cost.

[0009] The first option in fact requires scheduled periodic visits, some of which are very probably unnecessary because the vending machine might be found to be operating perfectly.

[0010] Moreover, in case of malfunction the vending machine remains out of operation until the next scheduled periodic visit, with possible machine downtimes and with a consequent loss of efficiency.

[0011] This also entails the fact that throughout the period in which the automatic device is not operating, the company that manages the vending machine acquires a negative image and clients become disaffected to the use of the vending machine.

[0012] The second intervention option instead has the drawback that in case of malfunction the vending machine remains out of operation until a user makes an intervention request call, which does not necessarily coincide with the beginning of the malfunction of the vending machine.

[0013] Moreover, the cause of the malfunction might not be easily identifiable by the user who makes the intervention request and therefore it becomes difficult to prepare the materials and spare parts in order to perform targeted intervention. Moreover, this entails lower efficiency in using said spare parts and the need

to perform interventions by taking to the site spares suitable to cover all possible faults of the vending machine.

[0014] The aim of the present invention is to provide a device for remotely monitoring vending machines and the like which allows to monitor the operation of the vending machine substantially in real time and automatically.

[0015] Within the scope of this aim, an object of the present invention is to provide a device for remotely monitoring vending machines and the like which allows the vending machine operator to perform rapid and efficient intervention in case of vending machine malfunction.

[0016] Another object of the present invention is to provide a device for remotely monitoring vending machines and the like which allows to reduce maintenance interventions to the minimum required to keep the vending machine efficiently in operation, accordingly avoiding downtimes in its use.

[0017] Another object of the present invention is to provide a device for remotely monitoring vending machines and the like which makes available sales data related to the vending machine, in order to perform statistical analyses, and data related to the consumption of the products offered by the vending machine, in order to restock the vending machine as soon as the machine requires it.

[0018] Another object of the present invention is to provide a device for remotely monitoring vending machines and the like which allows the operator of the vending machine to receive precise information regarding the cause of any malfunction of said vending machine.

[0019] Another object of the present invention is to provide a device for remotely monitoring vending machines and the like which is highly reliable, relatively easy to manufacture and at competitive costs.

[0020] This aim, these objects and others which will become apparent hereinafter are achieved by a device for remotely monitoring vending machines and the like, characterized in that it comprises cellular telephone communication means which are associated with a vending machine in order to automatically transmit a call to notify of malfunctions and/or statistical and sales data of said vending machine.

[0021] Further characteristics and advantages of the present invention will become apparent from the following detailed description of preferred but not exclusive embodiments of the device according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a block diagram of a first embodiment of the device according to the present invention, used in a vending machine;

Figure 2 is a block diagram of a second embodiment of the device according to the invention, used in a vending machine; and

Figure 3 is a block diagram of a third embodiment of the monitoring device according to the invention, used in a vending machine.

[0022] With reference to the above figures, in which identical reference numerals designate identical elements, and initially with reference to Figure 1, the remote monitoring device according to the invention comprises cellular telephone communication means 1 which are conveniently constituted for example by a GSM or TACS set or other device suitable for use in a mobile telephone network.

[0023] The telephone communication means 1 are connected, according to a first embodiment of the present invention, to a controller card 2 of a vending machine, which is provided with a serial output for the connection of said communication means 1.

[0024] In a second embodiment of the device according to the invention, shown in Figure 2, the cellular telephone communication means 1 are instead connected to a payment device 3 provided in the vending machine. The payment device 3 is provided with a serial output by means of which the connection to said cellular telephone communication means 1 is provided.

[0025] In the first and second embodiments, the firmware of the controller card 2 and of the payment device 3 is conveniently modified in order to manage the cellular telephone communication means 1.

[0026] In a third embodiment of the device according to the invention, shown in Figure 3, the cellular telephone communication means 1 are connected to interface means 4 which are connected both to the controller card 2 of the vending machine and to the payment device 3, in order to analyze communication between the controller card 2 and the payment device 3. On the basis of the resulting information, the interface means 4 manage the cellular telephone communication means 1.

[0027] Operation of the device according to the invention is as follows.

[0028] If a malfunction of the vending machine is detected, the cellular telephone communication means 1 automatically and simultaneously send a message. In the case of GSM telephony, for example, so-called short messages are used. This message is simultaneous with the malfunction of the vending machine, minimizing the downtime of said vending machine and damage in terms of image. The message can contain very precise information on the cause of the malfunction, accordingly allowing timely and very accurate maintenance and/or repair intervention.

[0029] The message is addressed to the operator of the vending machine, who then performs the intervention.

[0030] It is possible to activate the periodic sending of other messages, i.e., messages which are not correlated to a malfunction of the vending machine but are sent automatically by said vending machine to report

sales data, correct operating conditions of the vending machine, attempts at improper use of the vending machine, condition of the components of the vending machine, confirmation that maintenance operations are actually performed, indications concerning the quantity of products still available and the like.

[0031] In practice it has been observed that the device according to the invention fully achieves the intended aim and objects, since it allows to perform substantially real-time monitoring of a vending machine in order to provide its prompt maintenance, accordingly avoiding the need to resort to scheduled maintenance or to wait for a user to report a malfunction of the vending machine.

[0032] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may also be replaced with other technically equivalent elements.

[0033] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0034] The disclosures in Italian Patent Application No. MI98A002376 from which this application claims priority are incorporated herein by reference.

[0035] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

### 35 Claims

1. A device for remotely monitoring vending machines and the like, characterized in that it comprises cellular telephone communication means which are associated with a vending machine in order to automatically transmit a call to notify of malfunctions and/or statistical and sales data of said vending machine.
2. The device according to claim 1, characterized in that said cellular telephone communication means comprise an apparatus which is adapted to be used in a mobile telephone network.
3. The device according to claim 1, characterized in that said cellular telephone communication means comprise a GSM set.
4. The device according to claim 1, characterized in that said cellular telephone communication means are connected to a controller card of said vending machine.

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5. The device according to claim 1, characterized in that said cellular telephone communication means are connected to a payment device of said vending machine.
6. The device according to claim 1, characterized in that said cellular telephone communication means are connected to interface means which are connected to a controller card of said vending machine and to a payment device of said vending machine. 10
7. The device according to claim 4, characterized in that said cellular telephone communication means are connected by means of a serial connection to said controller card of the vending machine. 15
8. The device according to claim 5, characterized in that said cellular telephone communication means are connected by means of a serial connection to said payment device of said vending machine. 20
9. The device according to one or more of the preceding claims, characterized in that said cellular telephone communication means comprise a TACS set. 25
10. A vending machine, characterized in that it comprises a remote monitoring device according to claim 1. 30

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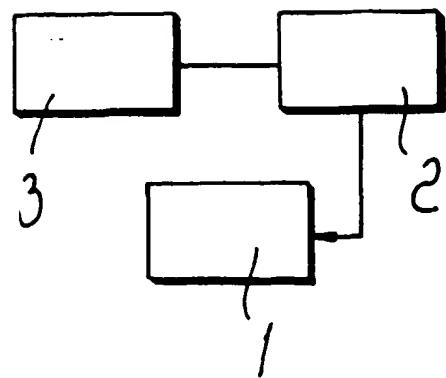


Fig. 1

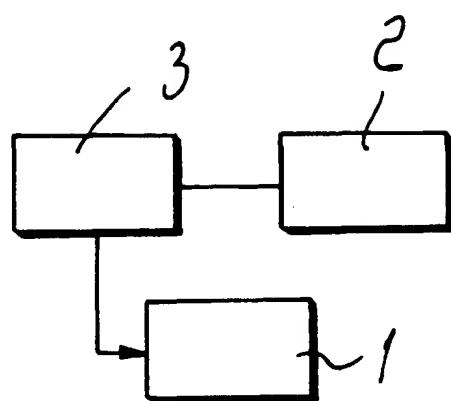


Fig. 2

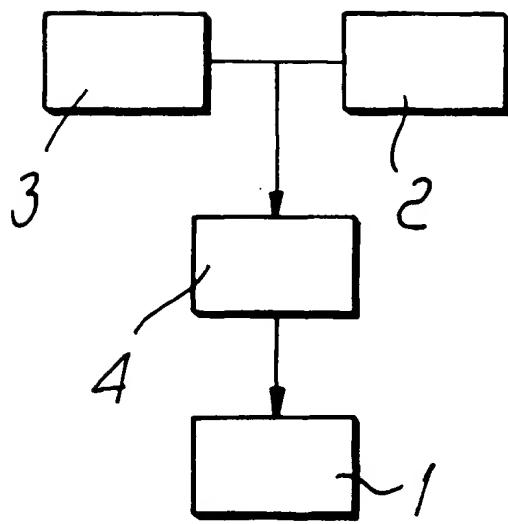


Fig. 3

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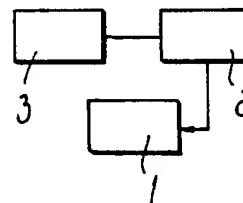


Fig. 1

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## EUROPEAN SEARCH REPORT

Application Number

EP 99 11 9930

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The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
THE HAGUE	13 October 2000	Bocage, S			
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document					
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## EUROPEAN SEARCH REPORT

Application Number  
EP 99 11 9930

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